

angle and revolution rate to provide criteria regarding whether ignition should be stopped or permitted, as discussed below in more detail.

Mingo is applied against the majority of features in claim 1, except for the cam sensor arrangement. Ott is cited for disclosing a crank angle sensor 10 and a cam sensor 14. Applicants respectfully note that it is not clear whether the Examiner is relying on the “crankshaft position sensor (CPS) 160” disclosed in Mingo (see column 3, lines 14-16 of Mingo), or whether the Examiner is relying on the crank angle sensor 10 of Ott. Because Mingo discloses the crankshaft position sensor 160, Applicants presume that the Examiner relies on Mingo’s sensor 160 to teach the crank sensor arrangement and not Ott. Nevertheless, Applicants respectfully submit that the features of claim 1 are neither taught nor suggested by the applied references.

Claim 1 recites, *inter alia*:

“the control unit has a start determination unit for determining whether starting the internal combustion engine is to be stopped or continued based on the crank angle and the number of revolutions just before the starter detection unit detects the starter being switched from a drive state to a non-drive state when the detected number of revolutions is less than idling speed...”

Upon a further review of Mingo, Applicants believe that the Examiner will understand that this reference is directed to determining whether a stall condition exists based on engine speed and whether the engine is running (see Figure 8, steps 802, 804). If the engine speed criteria is met, the device of Mingo issues a spark drop request (step 810), along with disabling

the fuel supply (step 812). As noted in Mingo, col. 3, lines 14-16, the crankshaft position sensor is used to determine the engine speed.

An exemplary aspect of claim 1 is the utilization of a crank angle and revolution rate just before the detection unit detects the starter being switched from a drive state to a non-drive state. Therefore, multiple criteria are used in the present invention: e.g., the crank angle and revolution rate. Mingo does not disclose at least these features.

First, Mingo does not base its determination on a crank angle. Instead, Mingo utilizes an engine speed which is determined using a crankshaft position sensor. Further, claim 1 describes that the determination is based on the crank angle and revolution rate just before the starter detection unit detects the starter being switched from a drive state to a non-drive state, when the detected RPM is less than idling speed. Mingo does not disclose the use of the claimed criteria, at the claimed time. More particularly, Mingo does not disclose the use of 1) the crank angle and revolution rate [e.g., two criteria]; 2) just before the starter detection unit detects the starter being switched from a drive state to a non-drive state [e.g., just before the starter is turned off]; and 3) that the determination is made when the detected RPM is less than idling speed. This unique combination of elements contribute to providing beneficial aspects not provided by the prior art.

The cam sensor of Ott does not make up for the lack of teaching in Mingo. Moreover, even if the crank angle sensor 10 of Ott were applied to Mingo, the claimed invention would still not be taught. Such a combination would result in two different scenarios: 1) the crank angle sensor 10 of Ott replacing the crankshaft position sensor 160 of Mingo; or 2) an additional

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crankshaft sensor in Mingo. The first scenario would not teach or suggest the present invention, nor would the second scenario that adds an additional crank sensor in Mingo. Further, one would not have been motivated to add an additional sensor to Mingo due to the inherent unnecessary duplication and complication of parts.

Therefore, Applicants respectfully submit that the combination of Mingo and Ott does not disclose each feature of claim 1, such that the rejection under 35 U.S.C. § 103(a) should be withdrawn. The rejection of claims 2-6 should also be withdrawn at least due to these claims respectively depending upon claim 1.

Claim 7

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mingo in view of Ott as applied to claims 1-6 above, and further in view of Kopera (US 4,106,460). The rejection of claim 7 is respectfully traversed in view of the following remarks.

Kopera is relied upon for allegedly teaching to control an engine ignition so that energization is terminated after a predetermined time at cranking speeds. Applicants submit that claim 7 contains different recitations than the Examiner's paraphrased language. Nevertheless, claim 7 depends from claim 1 and is submitted to be patentable over the references at least by virtue of its dependency. This is because the application of Kopera fails to supplement the deficient teachings of Mingo and Ott with respect to at least the features of claim 1. The rejection of claim 7 is respectfully requested to be withdrawn.